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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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EXAMINER

WEISKOPF, MARIE

ART UNIT PAPER NUMBER

3661

DATE MAILED: 03/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | | |
|------------------------------|------------------------|--|---------------------|--|
| Office Action Summary | Application No. | | Applicant(s) | |
| | 10/677,999 | | TONDRA ET AL. | |
| | Examiner | | Art Unit | |
| | Marie A. Weiskopf | | 3661 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 5-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-15 is/are rejected.
- 7) ☒ Claim(s) 5 and 6 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, see pages 15-27, filed 1/9/06, with respect to the rejection(s) of claim(s) 1-6, 8-9, 12-15 under 102(e) and 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of newly found prior art.
2. Applicant's arguments filed 1/9/06 in regard to claims 7, 10 and 11 have been fully considered but they are not persuasive.
 - In regard to claim 7, Applicant claims that Connor et al (US 2004/0135537) does not disclose an H-bridge controller for controlling the flow of current and voltage applied to the propulsion drive motor based upon the signal from the microprocessor. Examiner disagrees with this statement. Connor et al specifically states on page 5, paragraph 55: "The H bridge receives power from the high-voltage supply 810. Outputs of the H bridge are connected to motor windings of the motor 822. Properly phased and sequenced switch openings and closings within the H bridge 838 *cause current to flow in the motor windings and the generation of rotating magnetic fields that cause a rotor of the motor 822 to rotate.*" Furthermore, Applicant claims a standard H-bridge controller in combination with a microprocessor or otherwise is not capable of driving the brushless DC motor in Connor et al and specifically in paragraph 5 of Connor et al. In paragraph 56 on page 5, Connor et al specifically states that a brushless

DC motor is capable of working with a three-phase H-bridge controller and a compatible controller IC, which is deemed to be valid.

- In regard to claim 10, Applicant claims that there is no teaching or suggestion of the combination of Connor et al and Abramson et al (US 2003/0060928) in terms of a hall effect sensor positioned in an operative relationship with a wheel located on a main body of the floor care appliance to sense the desired direction and speed of the floor care appliance and provide a corresponding output. Examiner disagrees that there is no teaching or suggestion of the combination. Connor et al discusses on page 2, paragraphs 33-34, that the means for propulsion could be mounted in a lower portion of the upright housing and coupled to one or more of the rear wheels. Abramson et al, as discussed in the office action, actually teaches the use of a hall effect sensor positioned in an operative relationship with a wheel to sense the desired direction and speed of the floor care appliance. With this knowledge, and the discussion by Connor et al for the use of putting the propulsion elsewhere on the vacuum besides the handle, it would have been obvious to one having ordinary skill in the art at the time of the invention to use the wheels instead of the handle for the propulsion.
- In regard to claim 11, Applicant again claims that there is no teaching or suggestion of the combination of Connor et al and Abramson et al, however, examiner feels, as discussed in terms of claim 10, there is indeed teaching and the suggestion, therefore, the rejection of claim 11 stands the same.

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- In regard to claim 12, Applicant again claims that there is no teaching or suggestion of the combination of Connor et al and Abramson set al, however, examiner feels, as discussed in terms of claim 10, there is indeed teaching and the suggestion, therefore, the rejection of claim 12 stands the same. It would be inherent that if the self-propelled floor care appliance is either pushed or pulled the wheels of the vacuum cleaner will then move with the push or pull. When something is pushed, the wheels then move in the direction of that push.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Connor et al (US 2004/0135537) in view of Basham et al (US 5,044,043) or Wallach et al (US 6,925,679) or Salazar (US 5,130,710). Connor et al discloses an electronically commutated drive system for a vacuum cleaner, as discussed in the previous office action.

- In regard to claim 1, Connor et al discloses a programmable control arrangement for a self-propelled floor care appliance (Abstract), comprising:

- A self-propelled floor care appliance having a propulsion means for propelling the floor care appliance over a surface to be cleaned (Page 2, paragraph 33)
- A hall effect sensor positioned in an operative relationship with a handle located on the distal end of an upper housing of said floor care appliance to sense the desired direction and speed of the floor care appliance from the user and provide a corresponding output (Page 3, paragraph 36)
- A programmable microprocessor to receive the output from the device for outputting a signal according to pre-programmed logic (Page 1, paragraph 5; page 5, paragraph 57)
- A controller for receiving the signal and providing a voltage to a propulsion means at a corresponding voltage and polarity (Page 5, paragraph 60)

Connor et al, however, fails to disclose the microprocessor being pre-programmed to pulse width modulate the voltage applied to the propulsion drive motor based upon the position of the handle such that the response of the propulsion drive motor follows a pre-determined characteristic. Basham et al, Wallach et al, and Salazar all disclose controlling a motor with the use of pulse width modulation, which is well known in the art. Basham et al specifically discloses a variable voltage responsive to the operator's movements for providing an electrical signal representative of the desired speed in either the forward or reverse direction. (Abstract) Also, Basham et al teaches both drive motors for the vacuum cleaner responding to pulse width modulation for speed

control. (Column 6, lines 35-38) Wallach et al discloses the electronics pulse width modulates the power to enable the drive mechanism to work at a variety of speeds. (Column 6, lines 38-40) Salazar does not disclose a motor for a vacuum cleaner, however, Salazar does disclose a pulse width modulator for the use with a motor in order to be able to control the speed of the motor so as to not require an analog-to-digital converter. (Column 23, line 48 – Column 24, line 3; Column 30, lines 13-58) It would have been obvious to one having ordinary skill in the art at the time of the invention to use pulse width modulation in order to drive the motor based upon the position of the handle so that the vacuum cleaner can respond to the desire of the user effectively as discussed by all of the above references. Pulse width modulation for motors is also well known in the art which is shown by the references.

- In regard to claim 2, Connor et al discloses the hall effect sensor outputs a voltage of varying magnitude based upon the position of the hall effect sensor relative to a magnet embedded in the floor care appliance handle (Page 5, paragraph 59)
- In regard to claim 3, Connor et al discloses the floor care appliance handle is pushed and pulled by the user to cause the magnet embedded in the handle to move relative to the hall effect sensor to cause the propulsion means to propel the floor care appliance in the forward and reverse direction (Page 5-6, paragraphs 59-60)

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5. Claims 5, 6 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Connor et al (US 2004/0135537) in view of Basham et al (US 5,044,043) or Wallach et al (US 6,925,679) or Salazar (US 5,130,710) as applied to claim 1 above, and further in view of Graber et al (US 5,086,862.) Connor et al, Basham et al, Wallach et al, and Salazar et al are discussed above and Graber et al discloses an apparatus for stabilizing power steering for temperature effects.

- In regard to claims 5 and 6, Connor et al, Basham et al, and Wallach et al fail to disclose the pre-determined characteristic is based upon a mathematical algorithm or a table of values. Salazar et al and Graber et al, however, disclose the use of mathematical algorithms or look up tables for the pre-determined characteristics for the pulse width modulation. Salazar et al discusses the use of a mathematical algorithm and look up table in order to be able to provide quickly the value necessary for the next period's desired position for the motor. (Column 30, lines 14-58) Graber et al discusses the pulse width modulation being determined according to a preset formula which may be incorporated in a look-up table or set up in an algorithm for calculating the desired values. (Column 5, line 66 – Column 6, line 14) It would have been obvious to one having ordinary skill in the art at the time of the invention to use either a mathematical algorithm or a look-up table in order to be able to quickly provide the program the pulse width modulation necessary for controlling the propulsion drive for the vacuum cleaner so the user can easily control the vacuum cleaner by pushing on the handle.

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6. Claims 8, 9, 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Connor et al (US 2004/0135537) in view of Basham et al (US 5,044,043) or Wallach et al (US 6,925,679) and Salazar et al (US 5,130,710) or Graber et al (US 5,086,862). Connor et al fails to disclose the use of pulse width modulation to modulate the voltage applied to the propulsion drive motor by the H-bridge based upon the movement of the handle such that the response of the propulsion drive motor is based upon a mathematical algorithm. Basham et al, Wallach et al, and Salazar all disclose controlling a motor with the use of pulse width modulation, which is well known in the art. Basham et al specifically discloses a variable voltage responsive to the operator's movements for providing an electrical signal representative of the desired speed in either the forward or reverse direction. (Abstract) Also, Basham et al teaches both drive motors for the vacuum cleaner responding to pulse width modulation for speed control. (Column 6, lines 35-38) Wallach et al discloses the electronics pulse width modulates the power to enable the drive mechanism to work at a variety of speeds. (Column 6, lines 38-40) Salazar does not disclose a motor for a vacuum cleaner, however, Salazar does disclose a pulse width modulator for the use with a motor in order to be able to control the speed of the motor so as to not require an analog-to-digital converter. (Column 23, line 48 – Column 24, line 3; Column 30, lines 13-58) Salazar et al and Graber et al disclose the use of mathematical algorithms or look up tables for the pre-determined characteristics for the pulse width modulation. Salazar et al discusses the use of a mathematical algorithm and look up table in order to be able to provide quickly the value necessary for the next period's desired position

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for the motor. (Column 30, lines 14-58) Graber et al discusses the pulse width modulation being determined according to a preset formula which may be incorporated in a look-up table or set up in an algorithm for calculating the desired values. (Column 5, line 66 – Column 6, line 14) It would have been obvious to one having ordinary skill in the art at the time of the invention to use the pulse width to modulate the voltage applied to the propulsion drive motor and to use a mathematical algorithm or look-up table for the pulse width modulation value in order to run the motor according to the operator's desire from the position of the handle. Using a look up table and mathematical algorithm and pulse width modulation to vary the speed of a motor is well known in the art and would have been obvious to use.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marie A. Weiskopf whose telephone number is (571) 272-6288. The examiner can normally be reached on Monday-Thursday between 7:00 AM and 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Black can be reached on (571) 272-6956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


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